

CLAIMS

1. An apparatus comprising:

a first processing circuit configured to generate a plurality of reconstructed samples in response to one or more macroblocks of an input signal;

5 a second processing circuit configured to determine availability of intra 4 x 4 prediction modes for each luma sub-block of a current macroblock in response to available reconstructed samples adjacent to said current macroblock.

2. The apparatus according to claim 1, wherein said second circuit is further configured to indicate availability of an intra 4 x 4 prediction mode 3 for each of said luma sub-blocks in response to (i) a first group of said reconstructed samples adjacent to a top edge of said luma sub-block being available and
5 (ii) both said first group and a second group of said reconstructed samples adjacent to a left edge of said luma sub-block being available.

3. The apparatus according to claim 1, wherein said second circuit is further configured to indicate availability of an

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intra 4 x 4 prediction mode 7 for each of said luma sub-blocks in response to (i) a first group of said reconstructed samples adjacent to a top edge of said luma sub-block being available and
5 (ii) both said first group and a second group of said reconstructed samples adjacent to a left edge of said luma sub-block being available.

4. The apparatus according to claim 1, wherein said second circuit is further configured to indicate availability of an intra 4 x 4 prediction mode 8 for each of said luma sub-blocks in response to (i) a first group of said reconstructed samples adjacent to a left edge of said luma sub-block being available and
5 (ii) both said first group and a second group of said reconstructed samples adjacent to a top edge of said luma sub-block being available.

5. The apparatus according to claim 1, wherein said second processing circuit is implemented in a decoding loop of an encoder.

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6. The apparatus according to claim 1, wherein said first processing circuit and said second processing circuit comprise a decoder.

7. The apparatus according to claim 1, wherein said apparatus comprises an H.264 decoder.

8. The apparatus according to claim 1, wherein said second processing circuit comprises:

an intra prediction circuit configured to generate an intra predicted luma sub-block in response to said available reconstructed samples being adjacent to a single edge of said luma sub-block.

9. The apparatus according to claim 8, wherein said second processing circuit further comprises:

a control circuit configured to generate one or more control signals in response to (i) a first group of said reconstructed samples adjacent to a top edge of said luma sub-block being available, (ii) a second group of said reconstructed samples adjacent to a left edge of said luma sub-block being available and

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(iii) both said first group and said second group of said reconstructed samples being available.

10. The apparatus according to claim 9, wherein said control circuit is further configured to determine a position of said top edge and said left edge of said luma sub-block.

11. The apparatus according to claim 10, wherein (i) said first group of reconstructed samples comprise a plurality of reconstructed samples in a line adjacent to said top edge of said luma sub-block.

12. The apparatus according to claim 10, wherein (i) said second group of reconstructed samples comprises a plurality of reconstructed samples in a line adjacent to said left edge of said luma sub-block.

13. An apparatus comprising:
means for generating a plurality of reconstructed samples
in response to one or more macroblocks of an input signal;

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means for determining availability of intra 4 x 4
5 prediction modes for each luma sub-block of a current macroblock in
response to available reconstructed samples adjacent to said
current macroblock.

14. A method for intra prediction of a luma sub-block
comprising the steps of:

(A) generating a plurality of reconstructed samples in
response to one or more macroblocks of an input signal;

5 (B) determining availability of one or more intra 4 x 4
prediction modes for each luma sub-block of a current macroblock in
response to available reconstructed samples adjacent to said
current macroblock.

15. The method according to claim 14, wherein the step
(B) further comprises:

generating an intra predicted luma sub-block according to
an intra 4 x 4 mode 3 in response to (i) a first group of said
5 reconstructed samples adjacent to a top edge of said luma sub-block
being available and (ii) both said first group and a second group

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of said reconstructed samples adjacent to a left edge of said luma sub-block being available.

16. The method according to claim 14, wherein the step (B) further comprises:

generating an intra predicted luma sub-block according to an intra 4 x 4 mode 7 in response to (i) a first group of said reconstructed samples adjacent to a top edge of said luma sub-block
5 being available and (ii) both said first group and a second group of said reconstructed samples adjacent to a left edge of said luma sub-block being available.

17. The method according to claim 14, wherein the step (B) further comprises:

generating an intra predicted luma sub-block according to an intra 4 x 4 mode 8 in response to (i) a first group of said reconstructed samples adjacent to a left edge of said luma sub-
5 block being available and (ii) both said first group and a second group of said reconstructed samples adjacent to a top edge of said luma sub-block being available.

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18. The method according to claim 14, wherein the step
(B) further comprises:

generating one or more control signals indicating
availability of each of said intra 4 x 4 prediction modes in
5 response to availability of said reconstructed samples adjacent to
said current macroblock..

19. The method according to claim 18, wherein the step
(B) further comprises:

enabling intra 4 x 4 prediction modes 3 and 7 in response
to said one or more control signals indicating said available
5 reconstructed samples being adjacent to a top edge of said luma
sub-block; and

enabling intra 4 x 4 prediction mode 8 in response to
said one or more control signals indicating said available
reconstructed samples being adjacent to a left edge of said luma
10 sub-block.

20. The method according to claim 14, wherein the step
(B) further comprises:

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determining a position of a top edge and a left edge of said luma sub-block.

21. The method according to claim 20, wherein the step (B) further comprises:

determining availability of a plurality of reconstructed samples in a line adjacent to said top edge of said luma sub-block;

5 and

determining availability of a plurality of reconstructed samples in a line adjacent to said left edge of said luma sub-block.

22. The method according to claim 21, further comprising the steps of:

providing an indication that a diagonal down-left prediction mode and a vertical-left prediction mode are available in response to said plurality of reconstructed samples in said line adjacent to said top edge of said luma sub-block being available;

5 providing an indication that a horizontal-up prediction mode is available in response to said plurality of reconstructed

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10 samples in said line adjacent to said left edge of said luma sub-block being available; and

15 providing an indication that at least said diagonal down-left prediction mode, said vertical-left prediction mode and said horizontal-up prediction mode are available in response to said plurality of reconstructed samples in said line adjacent to said top edge of said luma sub-block and said line adjacent to said left edge of said luma sub-block being available.